

NOTES

UPPER RESPIRATORY TRACT

GENERALLY, WHAT IS IT?

PATHOLOGY & CAUSES

- Upper-airway infection (e.g. nasal cavity, pharynx, larynx) with pathogenic microbes

RISK FACTORS

- Compromised immunity; genetic, congenital malformations; concomitant infection

COMPLICATIONS

- Airway obstruction, infection spread, sepsis

SIGNS & SYMPTOMS

- Stridor; fever (if bacterial infection); discharge; difficulty swallowing

DIAGNOSIS

LAB RESULTS

- Cultures, complete blood count (CBC)
 - Bacterial involvement

OTHER DIAGNOSTICS

- Clinical presentation, physical exam

TREATMENT

MEDICATIONS

- Antimicrobials

SURGERY

- Surgical interventions

OTHER INTERVENTIONS

- Respiratory support, intubation (if severe respiratory obstruction)

VISIT...

LANZAROTE
Caliente.COM

BACTERIAL EPIGLOTTITIS

osms.it/bacterial-epiglottitis

PATHOLOGY & CAUSES

- Inflammation of epiglottis, nearby supraglottic structures
- Fluid, inflammatory-cell accumulation → rapid, progressive swelling of epiglottis, adjacent structures (supraglottic larynx) → airway narrows, ball-valve curling → airway obstruction

CAUSES

- Bacteria from posterior nasopharynx, *Haemophilus influenzae* (most common in children), *Streptococcus pneumoniae*, *Staphylococcus aureus*

RISK FACTORS

- Unimmunized status
- Mucosal trauma
 - E.g. burns, caustic substance/foreign body ingestion
- Most common in children 6–12 years old
- Comorbidities (adults)
 - E.g. diabetes mellitus, substance abuse, BMI > 25

COMPLICATIONS

- Airway obstruction
- Oropharyngeal secretion aspiration
- Cardiopulmonary arrest
- High mortality rate

SIGNS & SYMPTOMS

- **Children:** abrupt “3Ds” onset: dysphagia, drooling, distress
- **Respiratory:** stridor, retractions, tachypnea, cyanosis
- **Behavioral:** individual refuses to lie down; assumes tripod posture
- **Voice:** aphonia, muffled
- **Other:** sore throat, fever, odynophagia,

anterior neck tenderness, anxiety

DIAGNOSIS

DIAGNOSTIC IMAGING

Laryngoscopy

- Swollen, red epiglottis

X-ray

- Shadow of enlarged epiglottis (“thumb sign”); ballooning of hypopharynx

LAB RESULTS

- CBC: ↑ white blood cells (WBCs)
- ↑ C-reactive protein (CRP), positive throat culture

TREATMENT

MEDICATIONS

- Empiric antimicrobial therapy
 - E.g. third generation cephalosporin for *Haemophilus influenzae* colonization

OTHER INTERVENTIONS

- Airway management with humidified supplemental oxygen

Prevention

- *Haemophilus Influenzae* Type b (Hib) vaccine

LARYNGITIS

osms.it/laryngitis

PATHOLOGY & CAUSES

- Inflammation of larynx
 - Acute: < three weeks
 - Chronic: > three weeks

CAUSES

Acute

- Viral
 - Rhinovirus, influenza virus, parainfluenza, adenovirus
- Bacterial
 - *Moraxella catarrhalis*, *H. influenzae*, *S. pneumoniae*
- Fungal
 - *Candida* in immunosuppressed
- Trauma, nerve damage

Chronic

- Acid reflux, smoke exposure, allergies, rheumatoid arthritis, autoimmune disease

SIGNS & SYMPTOMS

- Flu-like
 - Fever, cough, malaise, enlarged lymph nodes
- Stridor, hoarseness, pain, odynophagia, lump in throat

DIAGNOSIS

DIAGNOSTIC IMAGING

Laryngoscopy

- Swollen, red vocal folds; biopsy

LAB RESULTS

- Blood culture

TREATMENT

MEDICATIONS

- Simple analgesics
- Non-steroidal anti-inflammatory drugs (NSAIDs)
- If bacterial infection, antibiotics

OTHER INTERVENTIONS

- Voice rest

NASAL POLYPS

osms.it/nasal-polyps

PATHOLOGY & CAUSES

- Overgrowths of epithelial tissue lining nasal cavity, paranasal sinuses
- Most commonly formed in maxillary/ethmoid sinus
- Results in airflow obstruction, mucus drainage blockage

CAUSES

- Unknown; associated with long-term inflammatory sinus conditions
 - Seasonal allergies, frequent asthma exacerbations, chronic sinusitis, aspirin sensitivity

RISK FACTORS

- Cystic fibrosis, primary ciliary dyskinesia

COMPLICATIONS

- Mucus drainage obstruction; sinusitis → recurrent infections

SIGNS & SYMPTOMS

- May be asymptomatic
- Bacterial infection
 - Blocked mucus drainage
 - Fever, headache
- Obstructed air flow
 - ↓ sense of smell, snorting, sleep apnea, cyanosis (in infants)

DIAGNOSIS

DIAGNOSTIC IMAGING

Endoscopy

- Direct visualization of nasal polyp

CT scan

- Hyperdense outpouching in nasal cavity

TREATMENT

MEDICATIONS

Topical steroids

- Nasal spray to shrink polyp; ↓ inflammation, swelling

Nasal saline lavage

- Underlying allergy treatment

SURGERY

- Endoscopic sinus surgery if unresponsive to steroids

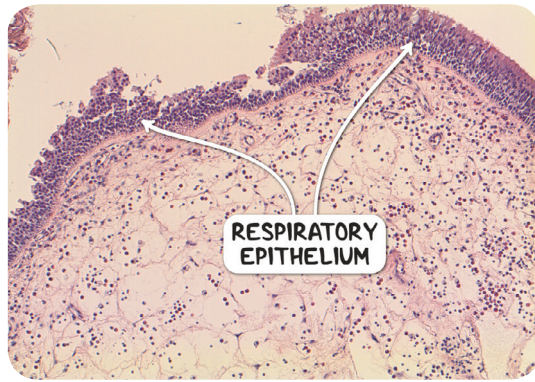


Figure 133.1 The histological appearance of a nasal polyp. There is loose, myxoid stroma lined by respiratory epithelium.

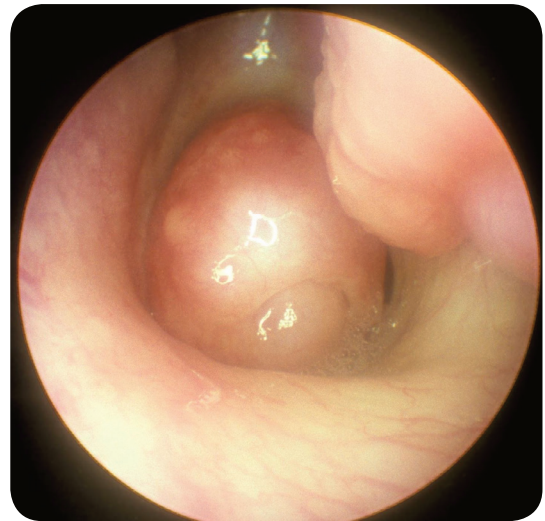


Figure 133.2 A trans-nasal view of a polyp in the posterior nasal passage.

RETROPHARYNGEAL & PERITONSILLAR ABSCESS

osms.it/rp-and-pt-abscess

PATHOLOGY & CAUSES

- Abscesses of the upper respiratory tract

TYPES

Retropharyngeal abscess

- Abscess formation in retropharyngeal space
 - Between buccopharyngeal fascia, alar fascia
- Bacteria of nasopharynx enter weakened mucosa → white blood cells (WBCs) follow, create pus → mass grows, pushes into airway

Peritonsillar abscess

- Pus in potential space between pharyngeal muscles, palatine tonsils

CAUSES

Retropharyngeal abscess

- Bacterial
 - *S. aureus*, group A beta-hemolytic bacteria, *H. parainfluenzae*
- Trauma, upper respiratory tract infections

Peritonsillar abscess

- *Streptococcus pyogenes* (most common) → acute tonsillitis
- *Staphylococcus*, *Haemophilus*, anaerobes of mouth flora (less common)

COMPLICATIONS

Retropharyngeal abscess

- Spread beyond retropharyngeal space, mediastinitis, pericarditis; pharyngitis, airway obstruction; sepsis

Peritonsillar abscess

- Retropharyngeal abscess, cellulitis of head and neck, sepsis

SIGNS & SYMPTOMS

- Fever, lethargy, swelling, sore throat

Retropharyngeal abscess

- Neck pain/stiffness, pharyngeal obstruction, difficulty swallowing, dyspnea, cough, stridor

Peritonsillar abscess

- Asymmetric tonsillar swelling with uvular displacement; lymph node enlargement
- Muffled voice, trismus, sleep disturbance (difficult breathing), snoring, halitosis

DIAGNOSIS

DIAGNOSTIC IMAGING

Contrast CT scan

- Tissue swelling

Ultrasound

- Differentiate Peritonsillar abscess from Cellulitis

LAB RESULTS

- Systemic spread in CBC, throat culture, blood culture

OTHER DIAGNOSTICS

Clinical presentation

- Swollen pharyngeal space tissues
- Redness, asymmetry

TREATMENT

MEDICATIONS

- IV antibiotics

SURGERY

- Surgical drainage of abscess
- Peritonsillar abscess
 - If airway obstruction, immediate tonsillectomy/incision, drainage

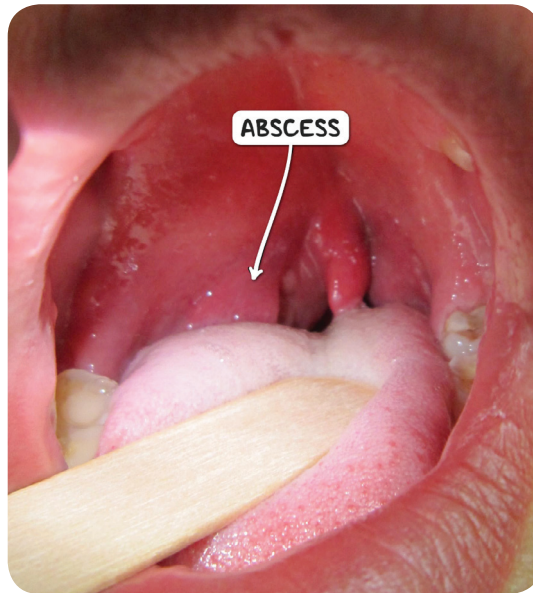


Figure 133.3 Clinical appearance of a right sided peritonsillar abscess which shows swelling of the palatopharyngeal arch.



Figure 133.4 A CT scan of the head in the axial plane demonstrating a peritonsillar abscess.

SINUSITIS

osms.it/sinusitis

PATHOLOGY & CAUSES

- Inflammation of sinuses, usually due to infection

CAUSES

- Influenza, parainfluenza, rhinoviruses, adenoviruses; bacteria of nasopharynx

RISK FACTORS

- Upper respiratory tract infections, allergies, teeth infections (spread to maxillary sinus), tumors, adenitis, nasotracheal/nasogastric tubes, genetic disorders (Kartagener, cystic fibrosis), deformation of bone

COMPLICATIONS

- Meningitis, cavernous sinus thrombosis, orbital/periorbital cellulitis, abscesses

SIGNS & SYMPTOMS

- Bacterial
 - Fever, headache, immediately previous upper respiratory infection, feeling of draining fluid, pain when leaning forward, voice change, last > 10 days
- Viral
 - Self-limiting, painful sinuses (esp. leaning forward), discharge, last < 10 days

DIAGNOSIS

DIAGNOSTIC IMAGING

- Rare

CT scan

- Screen for complications

LAB RESULTS

- CBC, leukocytes often normal
- Swabs, cannulation contraindicated due to high likelihood of sample contamination

TREATMENT

MEDICATIONS

Antibiotics

- If bacterial
- First line treatment, penicillin (amoxicillin with clavulanic acid); second line, fluoroquinolones

Corticosteroids (topical/systemic)

- Alleviate allergies

OTHER INTERVENTIONS

Steam treatments

- Dislodge secretions

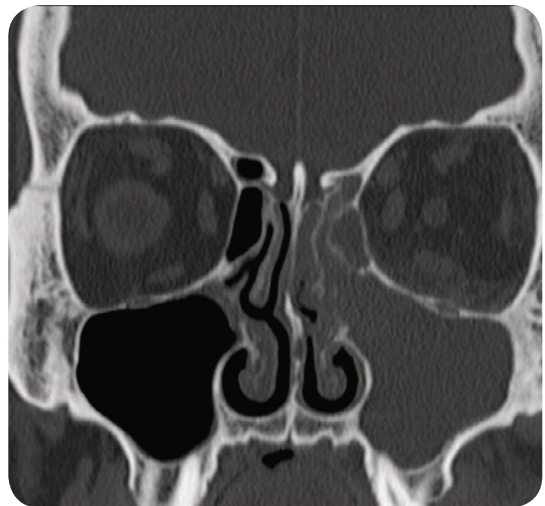


Figure 133.5 A CT scan of the head in the coronal plane demonstrating left maxillary sinusitis.

UPPER RESPIRATORY TRACT INFECTION

osms.it/upper-resp-tract-infection

PATHOLOGY & CAUSES

Pharyngitis

- Clinical syndrome characterized by sore throat, cervical lymphadenopathy; sore throat worsens with swallowing; typically accompanied by reactive enlargement of tonsils
- Inflammation of nasopharyngeal mucosa with reactive inflammation of lymph nodes, tonsils

The common cold

- Mild self-limiting viral infection characterized by nasal congestion, rhinorrhea, sore throat, nonproductive cough, low grade fever
- Most common upper respiratory tract infection
- Hand contact/inhalation of airborne droplets from infected individual → viral inoculation → deposition on nasal mucosa → viral replication → cytokines release from infected cells → immune response initiates → inflammation, congestion of nasal cavity mucous membranes
- Resolves within one week, symptoms last up to 10–14 days; esp. in young children < six
- No cross immunity between serotypes
 - Possible reinfection with milder symptoms, shorter duration

CAUSES

Pharyngitis

- Infectious
 - **Most common pathogens:** respiratory viruses (rhinovirus, echovirus, adenovirus, coronavirus), Group A *Streptococcus pyogenes* (GAS)
 - **Less common pathogens:** bacteria

(*Staphylococcus aureus*; Group C, G *Streptococcus*; *Arcanobacterium haemolyticum*; *Fusobacterium necrophorum*; *Mycoplasma pneumoniae*; *Chlamydia pneumoniae*; *Corynebacterium diphtheriae*; *Neisseria gonorrhoeae*; *Treponema pallidum*); **viruses** (respiratory syncytial viruses; influenza A, B; HIV; Epstein–Barr virus; cytomegalovirus; herpes simplex virus; parainfluenza; enteroviruses)

- Noninfectious
 - Allergic rhinitis
 - Irritative pharyngitis (due to dry air, esp. in winter)
 - Medications (e.g. angiotensin-converting enzyme inhibitors)
 - Kawasaki disease
 - Periodic fever, aphthous stomatitis, pharyngitis, adenitis (PFAPA) syndrome

The common cold

- Viruses
 - **Most common:** rhinoviruses (50% of all cases)
 - Coronaviruses, parainfluenza viruses, RSV, influenza, adenoviruses, coxsackie viruses

RISK FACTORS

The common cold

- Age, usually children < six; malnutrition; underlying diseases; immunodeficiency disorders; smoking; stress; sleep disturbances; weather, high prevalence in fall, winter

COMPLICATIONS

Pharyngitis

- Severe pharyngeal inflammation, abscess formation, tonsillar hypertrophy → upper

airway obstruction

- Post streptococcal
 - **Suppurative (spread of infection beyond pharynx):** otitis media; peritonsillar cellulitis/abscess; retropharyngeal abscess; sinusitis; meningitis; bacteremia; necrotizing fasciitis; jugular vein septic thrombophlebitis
 - **Non suppurative (immune mediated):** acute rheumatic fever, which can progress to rheumatic heart disease; post streptococcal glomerulonephritis; reactive arthritis; scarlet fever (delayed skin reactivity to erythrogenic toxin produced by GAS; requires prior exposure to GAS; characteristic scarlet rash, white with red enlarged papillae aka “strawberry tongue”); streptococcal toxic shock syndrome; pediatric autoimmune neuropsychiatric disorder associated with streptococcus (PANDAS)
- **Lemierre syndrome:** suppurative thrombophlebitis of jugular vein caused by *Fusobacterium necrophorum*

The common cold

- Secondary bacterial infection
 - Acute otitis media, sinusitis, pneumonia
- Asthma exacerbation

SIGNS & SYMPTOMS

Pharyngitis

- Reddening; edema of pharyngeal mucosa; sore throat, worsens when swallowing
- Neck pain/swelling due to reactive lymphadenopathy
 - Not prominent in viral pharyngitis
 - Prominent, tender, anterior cervical lymphadenopathy in bacterial pharyngitis
- Constitutional symptoms
 - Fever (low grade in viral pharyngitis, high grade in bacterial pharyngitis)
 - Headache, fatigue, malaise
- Swollen, reddened tonsils with white spots of exudate from tonsillar crypts
- Suggestive of
 - **Viral pharyngitis:** cough, nasal congestion, conjunctivitis, coryza, oral

ulcer, viral exanthem

- **Bacterial pharyngitis:** sudden onset of symptoms, high grade fever, tonsillopharyngeal edema, tonsillar exudates, painful cervical lymphadenopathy
- Symptoms resolve within 3–5 days in viral pharyngitis; 5–7 days in bacterial pharyngitis

The common cold

- Immune response to infection
- Nasal features
 - Congestion; clear, purulent, yellow/green discharge; sneezing; erythema, nasal mucosa swelling
- Nonproductive cough
- Sore throat
- Low grade fever
 - Predominant in young children; uncommon in older children, adults
- Headache, malaise, abnormal middle ear pressure, conjunctivitis

DIAGNOSIS

LAB RESULTS

Pharyngitis

- If suggestive of GAS pharyngitis (AKA strep throat)
 - **Rapid strep test (RST):** detects GAS antigens on swab sample of tonsils, posterior pharynx
 - **Throat culture:** more accurate than RST, takes 24 hours. If RST negative, but clinical suspicion of GAS pharyngitis; beta hemolytic, bacitracin sensitive, pyrrolidonyl arylamidase (PYR) positive colonies
 - **Polymerase chain reaction (PCR)-based assays:** more sensitive, rarely available
 - **Serological tests:** (antistreptococcal antibodies: anti-streptolysin (ASO), anti-hyaluronidase, anti-streptokinase, anti-nicotinamide adenine dinucleotidase, anti-DNase; ↑ titres suggestive of recent GAS infection; useful for detecting post streptococcal complications

OTHER DIAGNOSTICS

Pharyngitis

- Oropharyngeal examination
- **Centor criteria:** predict possibility of GAS pharyngitis
 - **1 point each:** fever, tonsillar exudates, tender anterior cervical lymphadenopathy, absence of cough, age < 15; subtract 1 point if age > 44
 - -1, 0, 1: no testing
 - 2, 3: testing required
 - 4, 5: empirical antibiotic treatment

The common cold

- Clinical presentation
- Re-evaluation if symptoms worsen/exceed expected recovery time

TREATMENT

MEDICATIONS

Pharyngitis

- Antipyretics/analgesics
 - Aspirin, acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs); for fever, pain control
- Salt water gargling
- **GAS pharyngitis:** antibiotics to prevent complications, reduce symptoms, prevent transmission
 - **First line treatment:** penicillin (penicillin V/amoxicillin)
 - **Alternatives:** cephalosporins, clindamycin, macrolides
 - **If recurrent/persistent:** repeat 10 day course of antibiotics

The common cold

- Topical saline/nasal suction/combination of nasal decongestant with antihistamines
- Antipyretics/analgesics
- Dextromethorphan/codeine to suppress cough

SURGERY

Pharyngitis

- Tonsillectomy
 - Recurrent infections

- Chronic tonsillitis unresponsive to antibiotics
- Tonsil enlargement causing airway obstruction
- Complications of pharyngotonsillitis
- PFAPA syndrome

OTHER INTERVENTIONS

Pharyngitis

- Viral pharyngitis often self-limited
- Symptomatic
 - Rest
 - Adequate fluids to loosen secretions, prevent airway obstruction

The common cold

- Symptomatic
 - Rest
 - Adequate fluids